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Description

Arrangement for controlling and monitoring a switchgear assembly

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Siemens document "SICAM HV - Digitale Leistungsschaltersteuerung" (Digital Breaker Control DBC), Order No. E5001_U113-A230/1 has disclosed an arrangement for controlling and monitoring a switchgear assembly, of which

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one of a plurality of switch panels is illustrated. On an uppermost hierarchical plane, the arrangement has a local control system which is formed by a station control computation device. Via a so-called field bus, there is a communications link between the station control computation

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device and a process control device and a protective device; the two latter devices form a central plane in the hierarchy. The two devices need to satisfy the environmental conditions in the switchgear assembly and also conditions for EMC (electromagnetic compatibility).

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The known arrangement also has a dedicated process bus for the switch panel shown, and, via this process bus, the process control device is linked to apparatuses for digitally controlling switches, said switches being isolating/grounding switches and a power breaker. In

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addition, the process control device is linked, via the process bus, to transformer electronics having digital outputs, which are usually arranged outside in the switch panel in the vicinity of the switches. The protective device in the known arrangement is connected on the input

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side directly to the transformer electronics and is linked on the output side to the apparatus for digitally controlling the power breaker.

The invention is based on the object of proposing an

arrangement for controlling and monitoring a switchgear assembly which can be produced with relatively little complexity.

5 This object is achieved according to the invention by an arrangement for controlling and monitoring a switchgear assembly having a station control computation device, in which the functions of at least one process control device and/or at least one protective device are integrated, and
10 having apparatuses for digitally controlling switches of the switchgear assembly having digital inputs and outputs; in addition the arrangement has transformer electronics, arranged in the vicinity of the switches, having digital outputs, the digital inputs and outputs of the apparatuses
15 for digital control and the digital outputs of the transformer electronics being logically linked to the station control computation device via arbitrary physical communications links.

20 One significant advantage of the arrangement according to the invention is the fact that it manages without a process control device and without a protective device, since the functions of these devices are transferred to the station control computation device; there is thus no special outlay
25 on these devices which is essentially determined by the fulfillment of the requirements as regards the environmental and EMC conditions. A further, significant advantage consists in the fact that a hierarchical plane, namely that formed by the process control and protective
30 device, is dispensed with, as a result of which a saving of one bus can be achieved. One additional advantage is provided by the fact that, for the station control computation device, a conventional computer may also be used for handling the functions of the process control

device and the protective device, and thus specially protected computation modules, as had to be used in previous arrangements for the process control and protective devices, are no longer required.

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With the arrangement according to the invention, the station control computation device can be formed in different ways. For example, the station control computation device for each switch panel of the switchgear assembly can in each case have one station control computer, in which the functions of the process control and protective devices, which are associated with the respective switch panel, are integrated. In this embodiment, computers may be used which have a relatively low performance.

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If a conventional computer having a relatively high computational power is available, it is advantageous if the station control computation device has, for at least two switch panels of the switchgear assembly, a common station control computation apparatus, in which the functions of the process control and protective devices, which are associated with the at least two switch panels, are integrated. This makes it possible to further reduce the overall complexity of the arrangement according to the invention.

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The arrangement according to the invention may, in a simple and cost-optimum manner, be of redundant design by the apparatuses for digital control and the transformer electronics being logically linked to a further station control computation device via further arbitrary physical communications links.

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In order to explain the invention further, an exemplary embodiment of an arrangement according to the invention is shown in the figure which has a station control computation device, formed by a station control computer, for a
5 switchgear assembly having a plurality of switch panels.

The arrangement 1 shown in the figure for controlling and monitoring a switchgear assembly 2, of which only one switch panel 3 is shown in the figure, has, as the station
10 control computation device, a station control computer 4, which may be a conventional computer, for example a PC. The station control computer 4 is, on the one hand, linked in a conventional manner to a network control computer N, and, on the other hand, is connected to a bus 5 as the physical
15 communications link. Apparatuses 6 and 7 for digital control having digital inputs and outputs 8 and 9 are linked to this bus 5; here, the apparatus 6 is an apparatus for digitally controlling an isolating switch 10 in the switch panel 3, and the apparatus 7 is an apparatus for
20 digitally controlling a power breaker 11. In addition, transformer electronics 12 are connected with their digital output 13 to the bus 5. The transformer electronics 12 have a voltage transformer 14 and a current transformer 15 applied to them on the input side.

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Further switch panels (not illustrated in the figure) of the switchgear assembly 2 are linked to the apparatuses 6 and 7, and transformer electronics, corresponding to the transformer electronics 12, are linked to the bus 5.

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In order to increase the functional reliability of the arrangement shown in the figure, the bus 5 and also the station control computer 4 may be of redundant design by a second bus 5a being installed in parallel with the bus 5,

and a second station control computer 4a, which is set up correspondingly, being installed in parallel with the station control computer 4.